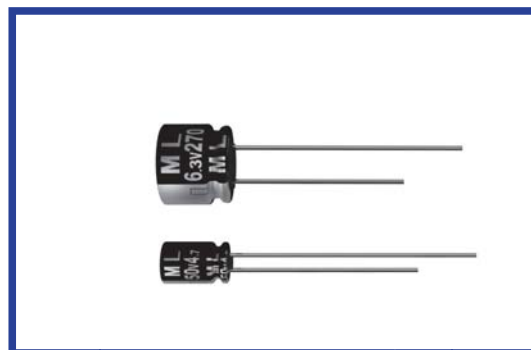


## ML series

105℃ 3000～5000時間品 高さ5mm～9mm  
105℃ 3000～5000hours. 5mm～9mm Height



### ◆規格表／SPECIFICATIONS

| 項目 Item                                                                  | 特性 Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|--------------|-------|--------------|-----------------|------------------------------|------------------------------------------------------------|-------------------------|---------------------------------------------|------|------|-----------------|----|----|---|---|---|---|
| カテゴリ温度範囲<br>Category Temperature Range                                   | -40～+105℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 定格電圧範囲<br>Rated Voltage Range                                            | 6.3～50Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 静電容量許容差<br>Capacitance Tolerance                                         | ±20%(20℃, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 漏れ電流<br>Leakage Current (MAX)                                            | I=0.01CV又は3μAのいずれか大なる値以下(定格電圧印加2分後)<br>I=0.01CV or 3μA whichever is greater. (After 2 minutes application of rated voltage)<br>I=漏れ電流(μA) C=静電容量(μF) V=定格電圧(Vdc)<br>Leakage Current Capacitance Rated Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 損失角の正接(tan δ)<br>Dissipation Factor (MAX)                                | <table><tr><td>定格電圧(Vdc)<br/>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td rowspan="2">(20℃, 120Hz)</td></tr><tr><td>tan δ</td><td>0.40</td><td>0.35</td><td>0.30</td><td>0.25</td><td>0.20</td><td>0.20</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 定格電圧(Vdc)<br>Rated Voltage                                                                                                                                  | 6.3                                             | 10                                                                                                                                                          | 16                   | 25                   | 35           | 50    | (20℃, 120Hz) | tan δ           | 0.40                         | 0.35                                                       | 0.30                    | 0.25                                        | 0.20 | 0.20 |                 |    |    |   |   |   |   |
| 定格電圧(Vdc)<br>Rated Voltage                                               | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10                                                                                                                                                          | 16                                              | 25                                                                                                                                                          | 35                   | 50                   | (20℃, 120Hz) |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| tan δ                                                                    | 0.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.35                                                                                                                                                        | 0.30                                            | 0.25                                                                                                                                                        | 0.20                 | 0.20                 |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 耐久性<br>Endurance                                                         | <p>105℃中で右表の時間定格電圧(リプル重畳)印加後、下記項目を満足すること。<br/>After applying rated voltage with rated ripple current for specified time at 105℃,<br/>the capacitors shall meet the following requirements.</p> <table><tr><td>静電容量変化率<br/>Capacitance Change</td><td>初期値の±30%以内<br/>Within ±30% of the initial value.</td><td rowspan="3"><table><tr><td>ケースサイズ<br/>Case Size</td><td>時間(hrs)<br/>Time(hrs)</td></tr><tr><td>L=5mm</td><td>3000</td></tr><tr><td>L≥7mm</td><td>5000</td></tr></table></td></tr><tr><td>損失角の正接<br/>Dissipation Factor</td><td>規格値の 300% 以下<br/>Not more than 300% of the specified value.</td></tr><tr><td>漏れ電流<br/>Leakage Current</td><td>規格値以下<br/>Not more than the specified value.</td></tr></table> | 静電容量変化率<br>Capacitance Change                                                                                                                               | 初期値の±30%以内<br>Within ±30% of the initial value. | <table><tr><td>ケースサイズ<br/>Case Size</td><td>時間(hrs)<br/>Time(hrs)</td></tr><tr><td>L=5mm</td><td>3000</td></tr><tr><td>L≥7mm</td><td>5000</td></tr></table> | ケースサイズ<br>Case Size  | 時間(hrs)<br>Time(hrs) | L=5mm        | 3000  | L≥7mm        | 5000            | 損失角の正接<br>Dissipation Factor | 規格値の 300% 以下<br>Not more than 300% of the specified value. | 漏れ電流<br>Leakage Current | 規格値以下<br>Not more than the specified value. |      |      |                 |    |    |   |   |   |   |
| 静電容量変化率<br>Capacitance Change                                            | 初期値の±30%以内<br>Within ±30% of the initial value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <table><tr><td>ケースサイズ<br/>Case Size</td><td>時間(hrs)<br/>Time(hrs)</td></tr><tr><td>L=5mm</td><td>3000</td></tr><tr><td>L≥7mm</td><td>5000</td></tr></table> | ケースサイズ<br>Case Size                             |                                                                                                                                                             | 時間(hrs)<br>Time(hrs) | L=5mm                | 3000         | L≥7mm | 5000         |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| ケースサイズ<br>Case Size                                                      | 時間(hrs)<br>Time(hrs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| L=5mm                                                                    | 3000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| L≥7mm                                                                    | 5000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 損失角の正接<br>Dissipation Factor                                             | 規格値の 300% 以下<br>Not more than 300% of the specified value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 漏れ電流<br>Leakage Current                                                  | 規格値以下<br>Not more than the specified value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                             |                                                 |                                                                                                                                                             |                      |                      |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| 低温特性<br>Low Temperature Stability<br>(インピーダンス比)<br>Impedance Ratio (MAX) | <table><tr><td>定格電圧(Vdc)<br/>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td rowspan="3">(120Hz)</td></tr><tr><td>Z(-25℃)/Z(+20℃)</td><td>6</td><td>4</td><td>4</td><td>3</td><td>2</td><td>2</td></tr><tr><td>Z(-40℃)/Z(+20℃)</td><td>12</td><td>10</td><td>8</td><td>6</td><td>4</td><td>4</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                   | 定格電圧(Vdc)<br>Rated Voltage                                                                                                                                  | 6.3                                             | 10                                                                                                                                                          | 16                   | 25                   | 35           | 50    | (120Hz)      | Z(-25℃)/Z(+20℃) | 6                            | 4                                                          | 4                       | 3                                           | 2    | 2    | Z(-40℃)/Z(+20℃) | 12 | 10 | 8 | 6 | 4 | 4 |
| 定格電圧(Vdc)<br>Rated Voltage                                               | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10                                                                                                                                                          | 16                                              | 25                                                                                                                                                          | 35                   | 50                   | (120Hz)      |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| Z(-25℃)/Z(+20℃)                                                          | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4                                                                                                                                                           | 4                                               | 3                                                                                                                                                           | 2                    | 2                    |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |
| Z(-40℃)/Z(+20℃)                                                          | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10                                                                                                                                                          | 8                                               | 6                                                                                                                                                           | 4                    | 4                    |              |       |              |                 |                              |                                                            |                         |                                             |      |      |                 |    |    |   |   |   |   |

### ◆呼称方法／PART NUMBER

|                       |                 |                     |                                  |               |                         |                     |
|-----------------------|-----------------|---------------------|----------------------------------|---------------|-------------------------|---------------------|
| □□□                   | ML              | □□□□□               | M                                | □□□           | □□                      | D x L               |
| 定格電圧<br>Rated Voltage | シリーズ名<br>Series | 静電容量<br>Capacitance | 静電容量許容差<br>Capacitance Tolerance | 副記号<br>Option | リード加工記号<br>Lead Forming | ケースサイズ<br>Case Size |

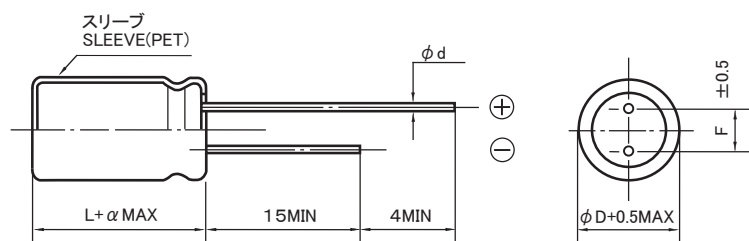
### ◆リプル電流補正係数／ MULTIPLIER FOR RIPPLE CURRENT

| 周波数 (Hz)<br>Frequency |              | 60(50) | 120  | 1k   | 10k  | 100k≤ |
|-----------------------|--------------|--------|------|------|------|-------|
| 係数<br>Coefficient     | 1 μ F        | 0.50   | 1.00 | 1.20 | 1.30 | 1.50  |
|                       | 2.2~6.8 μ F  | 0.65   | 1.00 | 1.20 | 1.30 | 1.50  |
|                       | 10~82 μ F    | 0.80   | 1.00 | 1.20 | 1.30 | 1.50  |
|                       | 100~1000 μ F | 0.80   | 1.00 | 1.10 | 1.15 | 1.20  |

### ◆副記号／OPTION

EFC : PETスリーブ PET Sleeve

◆寸法図／DIMENSIONS



|     |  | (mm)                    |     |                                |     |     |       |     |     |
|-----|--|-------------------------|-----|--------------------------------|-----|-----|-------|-----|-----|
| φ D |  | 4                       | 5   | 6.3                            | 8x5 | 8x7 | 8x7.5 | 8x9 | 10  |
| φ d |  | 0.45                    |     |                                |     |     |       |     | 0.6 |
| F   |  | 1.5                     | 2.0 | 2.5                            | 3.5 |     | 5.0   |     |     |
| α   |  | 35~100Vdc<br>160~450Vdc |     | L=7 : α = 1.0<br>L=5 : α = 1.5 |     | 1.5 | 1.0   | 2.0 |     |

◆標準品一覧表／STANDARD SIZE

Size φ D × L(mm), Rated Ripple Current (mA r.m.s./105°C, 120Hz)

| 定格電圧<br>(Vdc)<br>静電容量<br>(μF) | 6.3   |        | 10    |        | 16    |        | 25    |        | 35    |        | 50    |        |
|-------------------------------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
|                               | Size  | Ripple | Size  | Ripple | Size  | Ripple | Size  | Ripple | Size  | Ripple | Size  | Ripple |
| 1                             |       |        |       |        |       |        |       |        |       |        | 4×5   | 8      |
| 2.2                           |       |        |       |        |       |        |       |        |       |        | 4×5   | 11     |
| 3.3                           |       |        |       |        |       |        |       |        |       |        | 4×5   | 14     |
| 4.7                           |       |        |       |        |       |        |       |        |       |        | 4×7   | 23     |
| 6.8                           |       |        |       |        |       |        |       |        | 4×5   | 17     | 5×5   | 25     |
| 10                            |       |        |       |        |       |        | 4×5   | 18     | 4×7   | 28     | 5×7   | 30     |
| 12                            |       |        |       |        |       |        |       |        | 5×5   | 34     | 6.3×5 | 37     |
| 15                            |       |        |       |        |       |        | 4×7   | 35     |       |        |       |        |
| 18                            |       |        |       |        | 4×5   | 20     |       |        | 5×7   | 48     | 6.3×7 | 50     |
| 22                            |       |        | 4×5   | 22     | 4×7   | 40     | 5×5   | 42     |       |        | 8×5   | 62     |
| 27                            | 4×5   | 25     |       |        |       |        | 5×7   | 57     | 6.3×5 | 58     | 6.3×7 | 62     |
| 33                            |       |        | 4×7   | 43     | 5×5   | 45     |       |        |       |        | 8×7   | 75     |
| 39                            |       |        |       |        | 5×7   | 65     |       |        | 6.3×7 | 76     |       |        |
| 47                            | 4×7   | 47     | 5×5   | 48     |       |        | 6.3×5 | 65     | 8×5   | 80     |       |        |
| 56                            | 5×5   | 50     | 5×7   | 68     |       |        | 6.3×7 | 85     | 8×7   | 105    | 8×7.5 | 115    |
| 68                            |       |        |       |        | 6.3×5 | 70     |       |        |       |        |       |        |
| 82                            | 5×7   | 75     |       |        |       |        | 8×5   | 100    |       |        | 8×9   | 160    |
| 100                           |       |        | 6.3×5 | 75     | 6.3×7 | 95     | 8×7   | 112    | 8×7.5 | 125    |       |        |
| 120                           | 6.3×5 | 80     | 6.3×7 | 100    | 8×5   | 110    |       |        |       |        | 10×9  | 315    |
| 150                           |       |        |       |        | 8×7   | 125    | 8×7.5 | 140    | 8×9   | 180    |       |        |
| 180                           | 6.3×7 | 110    | 8×5   | 120    |       |        |       |        |       |        |       |        |
| 220                           | 8×5   | 125    | 8×7   | 160    | 8×7.5 | 170    | 8×9   | 190    | 10×9  | 360    |       |        |
| 270                           | 8×7   | 165    |       |        |       |        |       |        |       |        |       |        |
| 330                           |       |        | 8×7.5 | 180    | 8×9   | 195    | 10×9  | 450    |       |        |       |        |
| 470                           | 8×7.5 | 190    | 8×9   | 210    | 10×9  | 460    |       |        |       |        |       |        |
| 560                           | 8×9   | 230    |       |        |       |        |       |        |       |        |       |        |
| 680                           |       |        | 10×9  | 470    |       |        |       |        |       |        |       |        |
| 1000                          | 10×9  | 480    |       |        |       |        |       |        |       |        |       |        |